Funding a $200,000 Business Case to Plan the Development and Implementation of 21st Century Technology System for P-20 Education in Oregon

April 2013

Executive Summary

OEIB is requesting $200,000 from the legislature to create a business case to explore the development of a Pre K – 20 learning technology system. This system will synthesize existing longitudinal student and staff data with institution-level data to deliver the most relevant information to faculty, students, teachers, families, administrators and state-level educators to best help all students learn. Critical partnerships between ODE, CCWD, OED, DHS, YDC, ELC, OUS and a host of other partner agencies whose thinking and understanding of essential components of education, are essential to the development and implementation of this system.

The needs of all Oregon students, from early learners through college, are more diverse today than at any previous time in the history of public education. The traditional approach of assimilating students through a one-size-fits-all, core curriculum has become more challenging with each unique student need for which the education system was not designed to respond. Educational institutions have stretched dollars, people and capacity to be responsive to these growing needs, but systemic manipulation and lack of deliberate design has made the factory-sorting model far too costly and unsustainable to serve high-need students for the foreseeable future.

For Oregon to have any hope of achieving 40/40/20 in the present fiscal climate, the factory sorting model must be abandoned for a 21st century model of education, which builds responsive instruction aligned to the unique needs of students.

At present, only the most exceptional educators are able to collect, analyze and synthesize student data and information to develop individualized instructional paths. This capacity evades the majority of educators because of its complexity, time intensiveness and the lack of a robust support system. However, a data and technology system built to do this most critical piece of analysis, aligned to the best instructional practices, can overcome the most crucial hurdle keeping students from being presented the most relevant, engaging and appropriate instructional practices. Furthermore, it can empower families, administrators, and state level educators to become more meaningfully engaged in learning, enabling the sharing of best practices existing in pockets of excellence across the state.

Problem Statements / Description of Challenges

- Data essential to educational planning lies in disparate locations and is oftentimes inaccessible to those who need it or too complicated to gather and disseminate in a timely manner.
- P-20 educators do not have the capacity to perform the elaborate data collection, analysis and synthesis needed to constantly calibrate student needs in order to align an instructional plan, schedule or course sequence for each student.
- Educators are inclined to rely on practices with which they are familiar rather than seek out those that are research-based and most relevant to the needs of their underserved students.
- A lack of clear educator needs and a system to guide the exchange of ideas makes professional development costly and inefficient.
- Educators rely on outdated, annual data to guide institutional and instructional decision making allowing needs to go unmet for months which create serious foundational gaps in learning that permit a learning sequence to become meaningless.
- Learner feedback is frequently couched in terms of intangibles such as behavior and syllabus compliance, and does not empower a parent or student to independently target learning needs.
- Learning is rarely understood within a larger context of its relevance to college and career readiness or as a step on a pathway to help all students find meaning and select courses to ensure a level of readiness is reached quickly and without remediation or unnecessary, costly coursework.
- Inefficiencies and a systemic disconnect between the workforce and education systems create a knowledge gap that leaves educators frantically trying to reorganize their system to meet new needs of the workforce.

Value Propositions

- Educators will have access to necessary data and cutting-edge tools to assist them with effectively customizing instructional planning.
- 40-40-20 is only attainable if we change the instructional paradigm to one that is responsive to all students' unique needs and help them flourish in a process tailored to their unique needs.
- The single greatest factor in an educator's capacity is the ability to understand the unique needs of his or her students and design an appropriate, customizable instructional plan that can be carried out in a class with a diverse representation of student abilities and needs.
- All students must be prepared through the best and most relevant strategies in order to be prepared for the 21st century economy.
- Formalized channels of knowledge are critical for ensuring underserved students engage with learning opportunities that guide them towards earning qualifications highly desired in the regional economy and that will make them essential to employers.
- Connecting education and the business community through a system that permits industry demand to be immediately known by the education community will permit ongoing, organic transformations that allow educators to provide pathways consistent with workforce needs,

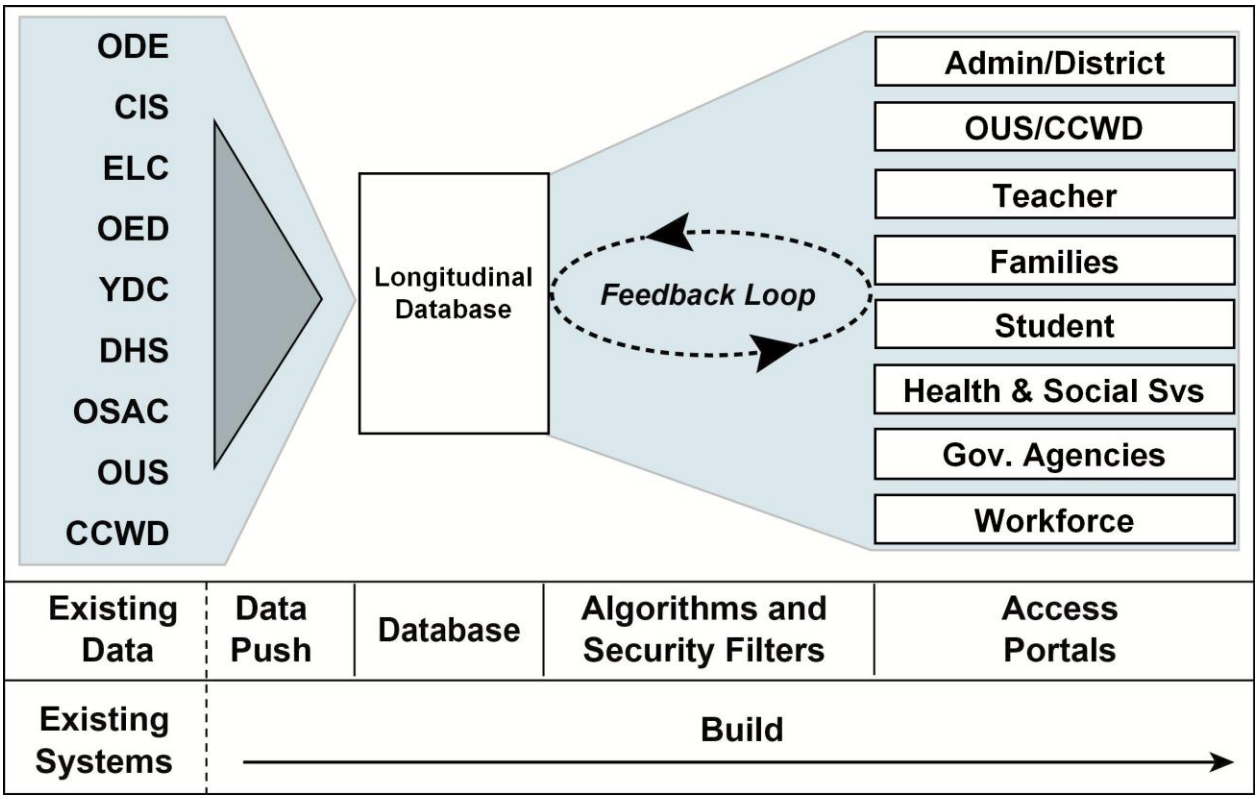
while simultaneously informing employers about where their training responsibilities begin and preventing a blame game from emerging about why the workforce is underprepared.

Core Principles Influencing Solution Development

- The single greatest difference between effective and ineffective education is whether instruction is responsive to the needs of the learner.
- Instructional planning is a process of ongoing, constant calibration. Yet educators cannot sustain the level of data management necessary without this tool to support students.
- Data is only valuable when it is accessible in a clear and understandable format, by the people who are empowered to take action on its behalf.
- Standardized test data is but one, frequently distorted data point that does not empower educators to effectively develop targeted instruction or institution-level programming.
- Data must exist in a secure feedback loop between students and educators, providing constant, daily calibrations between student ability and instructional planning.
- Execution of an effective educational plan is wholly dependent upon the unique learning needs and abilities of a student and is far too time consuming to be done appropriately on a student-by-student basis and with the necessary frequency.
- Data must be collected, analyzed and synthesized in a secure, real-time and automated fashion and presented to the right educators, families and students, just as banks have transitioned from a paper-based reporting system to their clients to an online banking experience to provide real-time access to accountholder information.
- Students and their families must have information that empowers them to focus private attention and resources on specific skill and learning gaps.
- College, career and employment data must be presented to students and families in meaningful ways that guide forward planning towards targeted goals and qualifications that are both obtainable and desired by postsecondary partners in the larger economy.
- Security is presently a more serious risk with highly sensitive information being housed in such disjointed ways. Disjointed data organization occurs at the peril of faculty, students and employers who are unable to make use of it.
- Educational institutions have a fundamental responsibility to ensure data remains secure. As that is part and parcel with OEIB's responsibility, it will be the standard to which all those accessing data will be expected to adhere.

Solution

An effective data system will incorporate ongoing regular data input through a capacity to be useful information at critical touch-points. Such information will enter a feedback loop between longitudinal student and staff data and other recently input data, where algorithms, designed from the most current research about correlations between learning and teaching, will be applied. While the system will largely be a collector of critical data, it's most important task will be to sort and distill data and present it back to educators and parents in a manner that offers clear and simple recommendations for how to best assist the student. The following diagram and text elaborate on this approach.



The solution is one that will integrate existing data streams, not simply into a single database, but into a system that analyzes and synthesizes the data in order for it to be presented to critical stakeholders in the most meaningful ways. The proper collection, assembly, analysis and synthesis of these data will provide answers to four essential questions most important to student and their interaction with the education system:

1. Who is the student and what are his or her unique needs?
2. What is the composition of the instructional program that best responds to the student's unique needs?
3. Have all relevant stakeholders been clearly provided with essential data to make the best decisions guiding the work as it relates to all phases of the P-20 continuum?

4. Is the student's learning and relevant supports connected to a larger career context to make learning meaningful and guide students towards a productive adult life?
5. Is this information delivered to the appropriate stakeholders to guide decision making at all levels of implementation?

Currently, this process is not possible to execute with a rapidity needed to effectively respond to the needs of students and families and the technology system will enable educators to do their jobs much more successfully and with greater focus on reforms that truly impact students.

While the P-20 system is a single, unified system, it is important to recognize that P-20 institutions have unique needs and ways of operating. In addition to the access to data and institutional integration with other institutions in the P-20 continuum, the larger architecture of this system will begin to reorient institutional thinking and behavior.

Institutional Impact Projections

P-20 Continuum				
Workforce	**University**	**Community College**	**K-12**	**Early Learning**
Regional workforce data from the employment department is input regularly, potentially live, into the system to establish demands and economic trends; Integrated Career Information System data will push information to students along with suggested pathways and course sequences to become employable or prepared for other higher education pursuits in a field.	Performance analytics drive expansion and contraction of program offerings, more authentic assessment of both academic and campus related needs	CC responds to constantly changing K-12 demand for industry relevant programs dictates high-demand programs be articulated into K-12 to create most relevant and desired career pathways; Performance analytics drive more focused, targeted remediation and expansion or contraction of program offerings consistent with student-side and economic demand to serve the needs of Oregon to compete in the global economy.	Integration of Early learning, discipline, health, instructional data to generate individualized curriculum tailored to students learning needs. Workforce data is coordinated with student strength and interest to permit student-side demand of job and industry-relevant coursework.	Aggregation and unification of most relevant records about development towards ready for school.

Once developed, the system will be able to perform the following:

- Act as a navigation system for all stakeholders from early learning through university, ensuring all are presented the most essential data for making the best decisions within their area of influence.
- Engage workforce and education in a dialogic relationship to ensure students drive changes in the system and create demand for services aligned to workforce demand
- Develop the next generation of the workforce to make Oregon attractive to industries from around the world
- Reorient the belief system of Oregonians to understand education as a process of responding to each student's unique needs in an individualized way rather than conscripting them through a narrow curriculum
- Empower students to take control of their learning and be guided guidance towards their goals
- Correlate informal feedback with lesson delivery to inform professional development
- Ensures high-level security for private records (Eliminates paper and unsecure filing systems)
- Use early learning and health data to aid planning and permit more effective inclusion and fewer pull-outs
- Incorporates informal assessments and inventory data to help tailor learning to interest and passion
- Presents students real-world career options based on Employment Department data and articulated pathways to the workforce
- Guides school leaders towards providing specific institution-level programming needs
- Guides movement towards proficiency teaching and learning
- Embed newest and best research into instructional planning
- Empower families with actionable data and information to help their students in targeted and relevant ways
- Guide the development and seamless replication of high quality, 21st century instruction
- Provide alternative, common measures to high stakes testing
- Ensure data and feedback are current and immediate
- Enable targeted, high quality interventions across the P-20 spectrum
- Drastically reduce human error in the course of instructional planning
- Guide government level educators around targeted funding.

Background and Existing Foundations

Currently, disparate databases have been made able to "talk" to one another, and generate reports from various data sources to address state and federal requirements. But a central nervous system making them usable by required stakeholders, able to integrate essential school and classroom-level data simply does not exist. It is this larger connective tissue that this endeavor will create.

Existing work with data has laid much essential groundwork however our systems are currently only able to generate high level reports. The systems and work, however, do not reach teachers and

schools in a manner that is necessary for delivering individualized, cutting-edge instruction to an ever-growing and changing diverse body of students.

Oregon's existing longitudinal data system contains a vast amount of data on students and staff that, when synthesized with coordinating data and research, will yield valuable information about student needs and the practices best capable of responding to those needs.

The various programs and initiatives listed below have worked to establish connectivity between various data sources including: Oregon Department of Education, Oregon University System, Community Colleges and Workforce Development, Teaching Standards and Practices Commission, Oregon Employment Department, Oregon Student Access Commission, various Student Information Systems, Youth Development Council, Early Learning Council's hubs and touch-points, and Department of Human Services.

Various state grants and funding already or previously secured toward aspects of this effort. The following list defines the purpose and outcomes of each.

- 1997 - Database Initiative (DBI) – Focus on school financial data and was funded by the 1997 legislature with $1.8m.
  - Implemented a standardized chart of accounts for financial data
  - Implemented a web-based data collection and reporting system for school and district level collections
  - Created the foundation for standardized student and staff collections leading to Oregon's longitudinal data system
- 2005 - K-20 Integrated Data System (KIDS) – Pilot for standardizing student records and transcripts to share across districts and was funded by the 2005 legislature at $1.8m.
  - Determined a standard set of data required for the daily exchange of student record and transcript data between school districts and ODE.
  - Developed a process and successfully exchanged student data on a daily basis between ODE and 4 Regional Data Warehouse Provider districts (Beaverton, Eugene, Hillsboro, and Portland)
- 2007- PK-20 Integrated Data System (KIDS) – Implementation of 2005 Pilot to standardize student records and transcripts to share across districts and with postsecondary partners. This effort was funded by the 2005 legislature at $8.5m (prior to cuts).
  - Expanded 2005 pilot work to statewide exchange of student data through existing Regional Data Warehouse Providers.
  - Created student record exchange system to provide real-time access to student records by school staff
  - Successfully piloted the exchange of transcripts with the Oregon University System.
- 2007 Direct Access to Achievement (DATA) – Bringing K-12 student-level data to in-service educators for creating a data-use culture in schools and was funded by the U.S. Education Department (USED) at $4.7m.
  - Created a data use culture in schools by bringing K-12 student-level data to in-service educators

- Five strands of instructional training were created with more than 6,000 educators trained; 140 districts participating; and 650 educators certified as project trainers.
- From 2008-2011, DATA Project districts' students improved significantly in performance for meeting/exceeding standards in reading and math.

- 2009 – Oregon Formative Assessment Resources (OFAR) built upon the work of the DATA project to include pre-service training modules on use of data and provided Oregon schools access to the University of Oregon's easyCBM formative assessment. This project was funded by the USED at $3.7m.
  - Provided Oregon schools access to the University of Oregon's easyCBM formative assessment
  - Leveraged the work of the DATA Project to include pre-service training modules on use of data.
  - Developed an e-based learning portal providing these modules, as well as other DATA Project training, to districts on-demand.
- 2010 – Advancing Longitudinal Data for Educational Reform (ALDER) – Began work to link student data to teachers, expanded Early Learning data, coordinated data with workforce partners, matched non-contiguous student records. This project was awarded $10.5m in 2010 by the USED and built upon previous work funded by Oregon and USED.
  - Developing a robust educator-student data link to track which courses are taken by students
  - Significantly expanding early learning and early childhood information flow to improve services
  - Streamlining data exchanges with community colleges and universities, and revised information exchanges with partner agencies to understand long-term workforce outcomes.
  - Project ALDER partner agencies are developing a shared vocabulary for data governance and improving data quality and security
  - Sustaining previous data-related grant work by supporting Direct Access to Achievement's initiatives around Common Core State Standards implementation, classroom formative assessment instruction, training for administrators, and coaching and guidance for implementing a culture of data use in district schools.

Consequences of a Failure to Act

- Annual increases in the cost of educating students, at a time when there has been a decrease in revenues to the state, have deemed the existing education model unsustainable. Continuing in this manner will cause only further fracturing of the system, continued disenfranchisement of thousands of students and families and a growing disbelief in the ability of public education to prepare students for the new economy.

- Without the ability to leverage technology in the most relevant ways, as every other facet of the American economy has been able to do in the last 20 years, educators will never be able to accelerate their rates of return, close the achievement gap or reach 40/40/20.

- An inability to respond to a growing diversity of students will continually disenfranchise students who do not fit within the core bandwidth toward which schools have historically only been able to serve effectively. The status quo will assist in perpetuating institutional racism as well as a host of issues that prevent social justice from becoming internalized by educators and communities making Oregonians more reliant upon social services that will increasingly tax an already stressed state tax base.

Privacy

Issues of privacy are of the highest concern in the development of this system. The current disparate state of data poses serious security risks, much of it currently being stored in file cabinets or desk drawers, in addition to a myriad of antiquated technology-based data systems. A new system will permit the most stringent and cutting-edge security protocols to be implemented, while simultaneously making only necessary data available to necessary members of the education community. This type of upgrade will increase security while simultaneously directing it through the most appropriate channels.

Outreach and Support

OEIB has worked in close coordination with members of CCWD and ODE, as well as leadership from the Employment Department, Early Learning Council and Youth Development Council. Emerging and future outreach will be conducted with OEA, OSBA, COSA, DHS and other agencies and groups as appropriate.

Ensuring data quality

While this system will collect some new, institution level data, it will primarily join data from existing source systems. Therefore data quality is more dependent upon (a) properly migrating the data from existing source systems and (b) ensuring that there is no drift in the interpretation or intended use of the data.

Project scope and management:

The Business Case that will be completed in the first year of the next biennium will help define and finalize the scope. Once defined, a Project Manager from ODE's Office of Assessment and Information Services will work in very close coordination with OEIB to guide project management processes including weekly updates and reports on project health, as well as the prioritizing of features to ensure timely delivery and manageable development.

Preliminary Business Case Cost Assessment

Process	Duration (est. 160 hr./mo.)	Number of staff	Estimated Rate	Projected Cost
Scope of Work ➢ Assembly of key stakeholders and development of a straw man ➢ Requirements document ➢ Assess state of current systems ➢ Gap analysis to identify gaps between the desired system and what currently exists ➢ Analysis of current state of the art in other states or countries ➢ Creation of a plan for going forward including schedules and costs	3 months	2	$150	$144,000
➢ Balancing of FSR ➢ Development of Schedule ➢ Financial Plan ➢ Resource Plan ➢ Risk Analysis	3 months	2	$150	$144,000
Quality Control Analysis	2 months	-	-	$50
Total Estimated Cost	8 months	-	-	**$338,000**

For additional questions and comments please contact Michael Seelig and Whitney Grubbs in the office of the Chief Education Officer.